# Solutions Quiz 1

PHY 2048C

Problem 1

$A_0$ → Initial Alberto
$S_0$ → " Sofia
$M_0$ → " Maria

$A_1$ → Final Alberto
$S_1$ → " Sofia
$M_1$ → " Maria

$$A_0 + S_0 + M_0 = 550$$
$$2S_0 = A_0$$
$$M_1 + 50 = M_0$$
$$A_1 + S_1 + M_1 = 200$$
$$S_1 = S_0$$
$$\frac{5}{4} S_1 = A_1$$

Six Equations
Six Variables

Solve for $S_0$

$$3S_0 + M_1 + 50 = 550$$

$$-\quad \frac{9}{4} S_0 + M_1 = -200$$

$$\left(3 - \frac{9}{4}\right) S_0 = 300$$

$$S_0 = \frac{300}{3 - \frac{9}{4}} = 400$$

Problem 2

Density of $H_2O$ in $\frac{lbm}{ft^3}$

$$\rho_{H_2O} = 1000 \frac{kg}{m^3} \left(0.3048 \frac{m}{ft}\right)^3 \frac{1}{0.454 \frac{kg}{lbm}} = 62.4 \frac{lbm}{ft^3}$$

Problem 3

$$X_2 = v_{2_0} t \; ; \; v_{2_0} = \frac{200}{11.2} = 8.93 \text{ m/s}$$

$$X_2 = v_{2_0} t \; , \; \frac{200}{11.6} = 8.62 \text{ m/s}$$

$$8.62 \times 11.2 = 96.6 \text{ m}$$

Problem 4

'mt' & 'b' must be the same units of y (lenght).

b → lenght

mt → lenght

t is in time so 'm' is in $\frac{\text{lenght}}{\text{time}}$